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Management Indicator Species Report – Part II

Little Deer Project

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Management Indicator Species (MIS) Report - Part II

Introduction

The purpose of this report is to evaluate and disclose the impacts of the Little Deer project on the Management Indicator Species (MIS) identified in the Klamath National Forest (Forest) Land and Resource Management Plan (Forest Plan) (USDA 1995) which was developed under the 1982 National Forest System Land and Resource Management Planning Rule (1982 Planning Rule) (36 CFR 219). This report documents the effects on the habitat of selected MIS from three alternatives: the modified proposed action (Alternative 2); an action alternative (Alternative 3); and the result of taking no action at this time (Alternative 1).. Detailed descriptions of the project alternatives are found in chapter 2 of the Little Deer project Environmental Analysis (EA). This report addresses all management indicator species (MIS) that may be directly or indirectly affected by the proposed project.

Direction Regarding the Analysis of Project-Level Effects on MIS

The Monitoring Requirements in Chapter 5 of the Klamath National Forest Land and Resource Management Plan (Forest Plan) do not require population monitoring or surveys on any MIS except for steelhead trout and rainbow trout. For MIS listed in the Forest Plan (pages 4-38 to 4-41), project-level MIS effects analyses are informed by project- and landscape-scale habitat analyses alone. Project-level effects on MIS are analyzed and disclosed as part of environmental analysis under the National Environmental Policy Act. This involves examining the impacts of the proposed project alternatives on MIS habitat by discussing how direct, indirect, and cumulative effects will change the quantity and/or quality of habitat in the landscape and project area (Forest Plan, page 4-39). The Forest Plan requirements for MIS analyzed for the Little Deer project are summarized in Part I of the MIS Report. Adequately analyzing project effects to MIS, involves the following steps:

- Identifying which MIS have habitat that will be either directly or indirectly affected by the project alternatives; (Forest Plan Standards and Guidelines (S&G) 8-21 through and including 8-34). This information is documented in Part I of the MIS Report.
- Identifying the Forest Plan forest-level monitoring requirements for this subset of forest MIS (Forest Plan, Chapter 5, Table 5-1). This information is documented in Part I of the MIS Report.
- Analyzing landscape- and project-level effects on habitats for which the MIS was selected to indicate in the Forest Plan.
- Relating project-level impacts on MIS habitat to habitat and population trends for fish MIS, per the Forest Plan.

The Management Indicator Species (MIS) Report Parts I and II document application of the above steps to select and analyze MIS for the Little Deer project.

Direction Regarding Monitoring of MIS Population and Habitat Trends at the Forest Scale

Forest scale monitoring requirements for the Klamath National Forest (Forest) MIS are found in Table 5-1 of Monitoring Plan by Resource of the Forest Plan.

Habitat Status and Trend

The requirement to evaluate landscape and project-level impacts to habitat conditions associated with the Species Associations and related MIS is identified in the Forest Plan on page 4-39. Habitat monitoring requirements are summarized in the MIS Report Part I. "Habitats" are the vegetation types (for example, mixed conifer forest) and/or ecosystem components (for example, river and ponds) and special habitat elements (for example, snags) as identified in the Forest Plan. "Habitat status" is the current amount of habitat on the Forest. "Habitat trend" is the direction of change in the amount of habitat between the time the Forest Plan was approved and the present.

Forest Plan Monitoring Requirements for MIS Selected for Project-Level Analysis

MIS Monitoring Requirements

MIS are animal species identified in the Forest Plan, which was developed under the 1982 National Forest System Land and Resource Management Planning Rule (1982 Planning Rule) (36 CFR 219). Guidance regarding MIS set forth in the Forest Plan directs Forest Service resource managers to: (1) at the landscape and project scale, analyze the effects of proposed projects on the habitats of each MIS listed in Forest Plan Standards and Guidelines 8-21 through8-34; and (2) assess presence of goshawk in suitable habitat and determine the number of pairs of northern spotted owls in Late Successional Reserves, and to conduct implementation monitoring to determine population trends and relationship to habitat changes for steelhead trout, and rainbow trout.

How MIS Monitoring Requirements are Being Met

Project level assessment of northern spotted owls and goshawks is not required for northern spotted owl and goshawks as an MIS species per Forest Plan S&G 8-21 through 8-34. Impacts to northern spotted owls are evaluated as a species listed under the Endangered Species Act and the impacts to goshawks are evaluated as a species designated as Sensitive by the Forest Service.

Forest Level MIS

The forest level MIS is used for the Forest Plan analysis, but the effects to Forest-level MIS are not analyzed at the project scale. Forest emphasis species black-tailed deer and Roosevelt elk are analyzed in the Wildlife Resource Report, available on the project website.

Selection of Project Level MIS Species

Management Indicator Species (MIS) for the Forest are identified in the Forest Plan S&G 8-21 through 8-34. A review was conducted using the MIS Report Part I - Project Level Assessment Checklist to determine: 1) if the project is within the range of any MIS, 2) if habitat for which the

species is an indicator is present within or adjacent to the proposed treatment areas, and 3) if there are potential direct, indirect or cumulative effects on habitat components.

The following associations and MIS will not be discussed further because the habitats for which these species were selected are not in or adjacent to the project area as documented in the MIS Report, Part I. Therefore, the project will not directly or indirectly affect the habitat for these species and will have no impact on forest-level habitat or population trends for these species:

Hardwood Species Association

- Acorn woodpecker
- Western gray squirrel

River/Stream Species Association

- Rainbow trout
- Steelhead
- Tailed frog
- Cascades frog
- American dipper
- Northern water shrew
- Long-tailed vole

Marsh/Lake/Pond Species Association

- Northern red-legged frog
- Western pond turtle

Grassland/Shrub-Steppe Species Association

- Pronghorn
- Montane vole
- Loggerhead shrike
- Swainson's hawk
- Sage thrasher
- Burrowing owl

Mature Ponderosa Pine Species Association (Eastside Pine)

- Flammulated owl
- White-headed woodpecker
- Pinyon jay

Although mature pine association habitat exists adjacent to the proposed project, no direct, indirect, or cumulative effects are expected to occur to this habitat type. The project area did contain small areas of mature pine habitat prior to the Little Deer fire, but the trees that made up this habitat were killed by the fire. Therefore, we don't expect this project to affect mature pine habitat association.

The following species associations and MIS were selected for analysis for the Little Deer project due to the presence of suitable habitat that may be impacted by the project activities, as described in the MIS Report, Part I. Species associations and MIS associated with habitats that may be affected by project activities are analyzed below.

Snag Association

- Black Backed Woodpecker
- White-headed woodpecker
- Downy woodpecker
- Red breasted sapsucker
- Hairy woodpecker
- Pileated woodpecker
- Vaux's swift

The MIS snag-dependent species association will be discussed as a group because the snag habitat within the analysis area is the result of high intensity wildfire and the recently burned and/or killed trees are not typical snag habitat. The cavity nesting, snag-associated MIS species that will be impacted by the proposed project have interdependent and complex life cycles, many of which rely specifically on this habitat type (i.e. black-backed woodpecker) with habitat needs that focus almost exclusively on snags and burned trees for both foraging and nesting.

The Forest Plan provides standards and guides for the snag association habitat management. Table 1 presents the basic recommendations of snag size and decay class for each species used to develop the snag association habitat. The Forest Plan also identifies the number of snags needed to provide high, moderate, and low capability for the list snag associated bird species.

Table 1: Klamath National Forest Plan direction for Snag Associated Species snag habitat

Numbers of Snags Required per 100 acres to Support "Good" Quality Habitat for Primary Cavity-Association Species. ( ) = Number of Snags per 100 acres			
Snag diameter (DBH)	**General snag decay stage**		**Total snags by diameter class**
	Hard (2-3)	**Soft (4-5)**	
	Downy (16)	(16)	
11+	Red Breasted/Black-Backed (45)	Hairy/White Hd. (225)	(270)
15+	Vaux's swift (200+)		(200+)
20+	Pileated (14)	(14)	(14)
24+		**Total snags**	**(500)**

Table 2: Forest Plan Snag Capability model for MIS - Snag Associated Species

High capability	Moderate capability	Low capability
> 5 per acre	2 - 5 per acre	< 2 per acre

Project Design Specifications and Effectiveness Rationale

Project design features that are in place for the proposed project are displayed on table 2-1 of the EA. The following information provides more detail for these design features.

Snag Retention

Within the salvage units, small clumps of snags that will be retained for the purposes of wildlife habitat. Leave groups will be distributed throughout harvest units and consist of clumps of snags all size classes available. The clumps will have similar stocking densities as the stand outside the wildlife leave areas. These wildlife leave islands will be comprised of snags or dying trees (other than those proposed for harvest under mortality guidelines) large enough to be expected to remain on the landscape for about five years. The total number of snags per acre required within each harvest unit may be captured within leave groups. Leave groups may contain the total number of snags retained for an individual harvest unit, represented as a percentage of the overall area rather than on a snag per acre basis. These snags will be retained as groupings within harvest units, rather than distributed individually on each acre within the unit.

Retaining denser clumps of large snags will promote the longer-term persistence of suitable snags as nesting habitat for cavity-nesting birds (Russell 2006). Snags in large burned areas have greater exposure to wind, causing them to fall at high rates. Haggard and Gaines (2001) found that treatments with snags distributed in clumps and individually dispersed had the highest abundance and species richness of cavity nesting species. Saab and Dudley (1998) found in their study that all bird species selected nest sites with higher tree densities than that measured at random sites, and cavity nesters as a group selected clumps of snags rather than snags that were retained in uniform, evenly-spaced distributions. Additional snag retention within the treatment area includes all pre-existing (existing prior to the wildfire) large snags (greater than 14 inches diameter at breast height), up to 1,000 snags >28" dbh and incense cedar >16" dbh. Many studies have found that large snags and incense cedar snags persist on the landscape longer than small diameter snags. Large diameter snags or those with deformities are the most frequently used type of snag for nesting for multiple species of cavity excavators (Hutto l995, Saab and Dudley 1998, Haggard and Gaines 2001). Deformities provide an avenue for heart rotting fungi which makes the snag more suitable for cavity excavation. Broken top trees are especially important in burns because they provide nest sites for the first few years following a high intensity fire when other trees are not as easily excavated due to case-hardening (Saab and Dudley 1998).

Proposed Actions and Alternatives Analyzed

A detailed description of the proposed actions is available in chapter 2 of the EA.

Methodology

The methodology for assessing habitat status and trend is

1) Use the GIS vegetation layers to describe the location of habitat for non-fish MIS within a project area,
2) Consider the reason the MIS habitat was selected as an Indicator, and determine the potential effects to that habitat for which an MIS was selected for.
3) Identify the indicated habitat using habitat relationships data or models in the Forest Plan Appendix I and California Wildlife Habitat Relationship (CWHR) System (CWHR 2005).

The CWHR System is considered "a state-of-the-art information system for California's wildlife" and provides the most widely used habitat relationship models for California's terrestrial vertebrate species (ibid).

4) Detailed information on the habitat relationships for MIS on the Forest and on the CWHR System can be found in the MIS Report Part I.
5) MIS habitat trend is monitored using ecological and vegetation data for the Forest. These data include spatial ecological and vegetation layers created from remote-sensing imagery obtained at various points in time, which are verified using photo-imagery, on-the-ground measurements, and tracking of events that change vegetation and stream conditions (for example, vegetation management, floods, and wildland fires).

Analysis Indicators

Black-backed woodpeckers are considered habitat specialists, relying heavily on post-fire conditions (particularly moderate to severely burned coniferous forests), and are therefore most susceptible to reductions in this specific habitat type. The strength of the association of black-backed woodpeckers with post-fire snag conditions makes it a useful indicator for wildlife associated with this habitat (Hutto 1995). Other species such as the hairy, downy and white-headed woodpecker (and the mountain bluebird, which is not an MIS but uses cavities excavated in previous years by black-backed woodpeckers) have strong, but not exclusive, associations with this habitat type.

Conifer stands that have burned with moderate or severe intensity are a distinct type of habitat and have a distinct set of species that rely on it. Those species can be divided into either primary cavity nesters or secondary cavity nesters, or into categories defined by the type of food item foraged upon such as wood/bark foragers or aerial (insect) foragers. For species that forage for wood boring beetles, the window of opportunity is short, due to the 2-3 year life cycle of most wood boring beetles (Haggard and Gaines 2001).

The importance of recently burned forests to breeding cavity-nesting birds is well known (Hutto 1995, Saab 2008, Russell 2006). Densities of cavity nesters in burned forests change with time since the initial fire (Saab 2007). Species that obtain their insect prey from wood, such as black-backed woodpeckers, rapidly colonize post-fire forests and then experience population declines as time since fire increases, likely due to declines in bark and wood-boring beetles (Saab 2007). The Tennant fire occurred on the Goosenest RD in 2009 and just a year later black-backed woodpeckers were observed near the fire location. Formal surveys for black-backed woodpeckers are not required, and have not been conducted, but incidental reports of woodpeckers on the district have increased yearly since that original report in 2010. During 2014 there were 20 observations of black-backed woodpeckers on the Goosenest RD.

Post-fire salvage logging removes snags that provide breeding, roosting, and foraging habitat for many species (Kotliar 2002, Hutto and Gallo 2006). Studies indicate that wood and bark foraging species favor unlogged burned forests due to greater foraging opportunities in areas with high snag densities, whereas some aerial insectivores and other open-space foragers can use partially logged post-fire forests due to more open space for aerial foraging maneuvers (Saab and Dudley 1998, Haggard and Gaines 2001, Saab 2002). Prey availability and predation pressure also differ between salvage-logged and unlogged areas and may influence the overall use of these areas (Saab 2007).

Snag abundance is a limiting factor for primary cavity excavators because they excavate a nest cavity each year (Haggard and Gaines 2001). Primary cavity excavators are important members of forest ecosystems because the cavities they excavate may be used by secondary cavity nesters, including bats, American marten, many owl species, and other birds and because they influence insect numbers.

Saab and Dudley (1998) found species such as black-backed and hairy woodpeckers to be most abundant in stands with a high density of snags. Species that are considered to be more habitat generalists, and are also more abundant throughout their range, were found to be more abundant in the stands with the lower snag densities. Species that are associated with open-canopy stands, such as Vaux's swift, downy woodpecker, and western bluebird may benefit from post-fire logging in dense stands where it will take years for the snags to fall on their own to create open conditions (Saab 2002) though these species are not nearly as restricted to post-fire habitat and commonly occur in naturally open, unburned, conifer forests as well.

Salvage logging influences densities or relative abundances of cavity nesting and some non-cavity nesting birds (Cahall 2007, Hutto 2006). Maintaining unsalvaged areas in burned forests will provide habitat for species of birds negatively influenced by salvage logging (Cahall 2007, Saab and Dudley 1998, Dudley 2005). Retaining large snags after salvage logging will provide foraging habitat for multiple species of woodpecker (Cahall 2007).

It is important to emphasize the proportion of area proposed for tree removal in relation to the overall burned area, and the overall availability of this habitat type, specifically areas that burned in high and moderate severity that will not be treated. Within the entire burned area of the Little Deer Fire, there are 4,512 acres that burned in high or moderately high severity (Table 3). Alternative 2 proposes harvest on 1,663 acres plus 135 acres of public firewood, or 40% of the high to moderately high severity burned area. Alternative 3 will harvest 1,548 acres plus 47 acres of public firewood, or a total of 35% of the high to moderately high severity burned area. The remaining acres of post-fire habitat will provide snag habitat for species associated with this habitat type. Up to 10% of the acres within treatment units will also be retained as randomly placed wildlife leave areas. Post-fire timber harvest can compound the original impacts to the habitat from the fire, whether they are negative or positive (Hutto 1995, Hutto and Gallo 2006, Saab and Dudley 1998, Hanson 2008). Removing burned trees/snags from of a large wildfire may impact the availability of this habitat within the watershed. However, the retention of groups of snags that may contain the largest of the available snags in addition to all pre-existing snags will help to maintain the suitability of the habitat within the areas that have tree removal and retain many of the important post-fire habitat characteristics.

Actions proposed with the Little Deer project that will affect habitat for the snag association species selected for this MIS analysis will be those that impact the availability and suitability of the habitat within the project area. The only proposed activity that falls into this category is tree removal. The remaining activities (reforestation, browse planting, fuels treatments) are not pertinent to this MIS habitat analysis because they do not affect habitat suitability or availability; nor will the season of operation.

Therefore, the pertinent issue for the effects analysis to MIS snag association habitat is tree removal.

Spatial and Temporal Bounding of Analysis Area

Spatial bounding for this analysis is the total available habitat for post-fire dependent snag associated species within the boundary of the Little Deer fire. Available habitat is defined for the purposes of this analysis as coniferous forest burned in the Little Deer fire, with high to moderate intensity. Temporal bounding was deemed appropriate for this analysis because after 5 years, the primary cavity nesting bird species composition changes in response to the life cycle of the wood boring beetles they prey upon (Hutto 2006, Kotliar 2002). Species composition also changes in response to the loss of foraging and nesting structures as snags fall. Forest canopies become more open, providing more suitable foraging conditions for aerial insect foragers. The definition of available habitat was spatially bounded by the boundary of the Little Deer fire because it is a large enough area to capture the snag habitat possibly used by post-fire associated MIS species occupying the project area.

Affected Environment

The vegetation within the project area is composed mostly of severely burned coniferous forest, primarily ponderosa pine with small areas of mixed conifer and incense cedar. These conifer stands are interspersed with antelope bitterbrush, manzanita, mountain mahogany, rabbit brush, and various ceonothus species. (For in-depth discussion of vegetation in the project area the silviculture report is available in the project record).

The majority (82%) of the Little Deer fire burned with moderate or high severity across approximately 4,512 acres. Areas proposed for tree removal in Little Deer represent the high and moderate severity burned areas (Table 3). Other treatments proposed for the burned area (i.e. reforestation, browse planting, fuels treatments) are proposed in the burned area.

Table 3: Acres of Little Deer fire and burn severity

Acres of Little Deer fire	Acres and % of Little Deer fire burned with h/m severity
5,503	4,512 = 82%

Environmental Consequences

MIS CATEGORY: SNAG ASSOCIATION

Direct Effects and Indirect Effects

Alternative 1

There are no direct or indirect effects expected from Alternative 1 because no treatments will occur that will remove or modify post-fire snag habitat.

Alternatives 2 and 3

While all action alternatives have tree removal proposed, the difference between these alternatives that is pertinent to this analysis is the acres of snags removed within the Little Deer fire boundary. The Little Deer analysis area contains 5,503 acres of burned forest. Alternative 2 will remove 1,912 acres of snag habitat, or 35% of the 5,503 acre Little Deer fire. Alternative 3 will remove 1,798 acres of snag habitat or 28% of the area burned in the Little Deer wildfire.

Cumulative Effects

Alternatives 2 and 3

While all action alternatives have tree removal proposed, the difference between these alternatives that is pertinent to this analysis is the acres of snags removed within the Little Deer fire boundary. The Little Deer fire contains 5,503 acres of burned forest, but 2,133 acres will not be treated. Alternative 2 will remove 1,912 acres of snag habitat from the Project area, or about 35% of the 5,503 acre Little Deer fire. Alternative 3 will remove 1,595 acres of snag habitat from the Project area, or 33% of the area burned in the Little Deer wildfire. The manner in which the snags are retained will be the same across all action alternatives (i.e. retained in clumps, the retention of all pre-existing snags, retain >10snags/acre, up to 1,000 snags >28" dbh within the treatment area and incense cedar >16" dbh).

Because the overall suitability of the habitat for post-fire snag associated MIS is directly related to the number of available snags in post-fire habitat, it will follow that the more snags retained, the more habitat is available. As discussed above, salvage harvest has impacts on the suitability of post-fire habitat for snag associated species. Areas that are harvested may decrease in suitability for some species, but not for all. No treatment unit will be left completely devoid of snags, and so should not be considered as complete habitat lost. Instead, the resulting stand may provide habitat for aerial foragers (such as downy woodpeckers) that require more open areas between snags, rather than wood/bark foragers (such as black-backed woodpeckers) that require more available foraging substrate i.e. snags or dying trees. However, all of the MIS species in this analysis require a relatively large number of snags within the post-fire habitat. It is a matter of the overall proportion of snags within the stand that dictates for which species it is the most suitable. In units where tree removal is proposed, an increase in the number of snags retained will have a subsequent increase in the suitability of the stand as post-fire snag habitat.

The threshold at which removal of fire-killed trees has no limiting effects on overall availability of post-fire habitat and the species associated with it, is unknown (Saab and Dudley 1998, Saab 2002, Hutto 2006). The abundance of severely burned habitat that will remain untreated and the project's snag retention design features will alleviate much of the impact from tree removal within the project area.

The untreated areas within the Little Deer Project will not receive any additional treatment in the foreseeable future that will have additive impacts to MIS habitat. Some of the private lands in the analysis area were harvested post-fire and other lands are in the planning stage for harvest so the private land within the analysis area is assumed to be harvested and will not provide snag habitat.

Compliance with law, regulation, policy, and the Forest Plan

Management Indicator Species (MIS) for the KNF are identified in the Forest Plan S&G 8-21 through 8-34. A review was conducted using the MIS Report Part I - Project Level Assessment Checklist to determine 1) if the project is within the range of any MIS, 2) if habitat for which the species is an indicator is present within or adjacent to the proposed treatment areas, and 3) if there are potential direct, indirect or cumulative effects on habitat components.

This report meets the requirements and direction for MIS as specified in the Forest Plan (USDA 1995) which was developed under the 1982 National Forest System Land and Resource

Management Planning Rule (1982 Planning Rule) (36 CFR 219). The Forest Plan Consistency Checklist was reviewed to ensure the project complies with the Forest Plan. Alternatives were developed to meet the stated purpose and need of the project and the monitoring requirements in Chapter 5 of the Forest Plan. This MIS Report meets the requirement to evaluate landscape and project-level impacts to habitat conditions associated with the species associations and related MIS as identified in the Forest Plan on page 4-39 and the MIS for the Forest as identified in the Forest Plan S&G 8-21 through 8-34.

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